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PATENT APPLICATION

**RESPONSE UNDER 37 CFR §1.116
EXPEDITED PROCEDURE
TECHNOLOGY CENTER ART UNIT 2123**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Richard M. WASSERMAN

Application No.: 09/243,689

Filed: February 3, 1999

For: **HARDWARE VISION SIMULATION SYSTEMS AND METHODS FOR VISION
INSPECTION SYSTEMS**

Group Art Unit: 2123

Examiner: E. Garcia-Otero

Docket No.: 101473

REQUEST FOR RECONSIDERATION AFTER FINAL REJECTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Sir:

In reply to the September 23, 2003 Office Action, reconsideration of the rejections is respectfully requested in light of the following remarks.

Claims 45-72 are pending in this application.

The Office Action rejects claims 45, 46, 48-50, 52, 53, 55 and 56 under 35 U.S.C. §102(a) over "Modeling optical vision systems with innovative software" by Michael Stevenson et al. (hereinafter "Stevenson"); and rejects claims 47, 51, 52, 54 and 57-72 under 35 U.S.C. §103(a) over Stevenson in view of U.S. Patent 5,137,450 to Thomas (hereinafter "Thomas"). The rejections are respectfully traversed.

In order to be anticipatory under 35 U.S.C. §102, a prior art reference must have each and every feature set forth in the claims. (See MPEP § 2131) This principle was not

followed by the Examiner in formulating the rejection of claims 45, 46, 48-50, 52, 53, 55 and 56. Moreover, the differences between the prior art and the claims were not properly determined, as required by *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966) in rejecting claims 47, 51, 52, 54 and 57-72 under 35 U.S.C. §103(a).

When interpreting and applying the teachings of the cited references, and particularly *Stevenson*, to reject Applicant's claims, the Office Action improperly assumes or infers certain aspects of claims 45-72 to be present in the applied art. This examination practice is contrary to the existing case law and Patent Office procedure, as discussed below.

Case law is clear that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). The identical invention must be shown in as complete detail as is contained in the ...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added). The elements must be arranged as required by the claim, *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990) (emphasis added).

An Examiner cannot consider just the features recited in the body of the claim. An Examiner must also consider the language of the preamble of the claim. "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999) (emphasis added).

Stevenson does not disclose, teach or suggest an "off-line programming system for a machine vision system...operable to..." , as set forth in the preamble and body of

independent claims 45 and 55. Moreover, claim 57 recites an off-line simulation system with a user interface similar to the user interface of the machine vision inspection system, clearly establishing the off-line simulation system as separate from the actual machine vision inspection system. Further, Stevenson does not disclose, teach or suggest "operating an off-line programming system for a machine vision inspection system", as set forth in independent claim 65, or performing "off-line machine vision inspection system simulation for a machine vision inspection system", as set forth in independent claim 69.

The Office Action, at items 10-11, asserts that Stevenson, at page 29, discloses this feature. Applicant respectfully disagrees.

Stevenson, at page 29, states that

[a]mong the different types of available optical vision systems is one common goal: they all concentrate on producing high-quality images. By designing computer models of these systems, they can be readily fine-tuned or even constructed - a process that saves time, effort, and money.

(emphasis added)

The Office Action, at page 2, in interpreting Stevenson, asserts that

the explicit purpose in Stevenson's 'computer models' (simulations) is to 'fine-tuned or even construct' actual physical optical vision systems. Said optical vision systems are typically computer controlled, and are typically taken off-line during programming.

(emphasis added)

First, contrary to the Office Action's interpretation, Stevenson, in the above passage at page 29, only describes a common goal of available optical vision systems. The Office Action impermissibly infers or assumes that Stevenson discloses certain features of independent claims when, in fact Stevenson does not disclose these features.

Second, Stevenson is simply directed to an image simulation engine / image rendering system. Stevenson discloses using two computer packages, the Advanced Systems Analysis Program (ASAP) and Rhinoceros computer packages, to analyze the optical performance of a system, such as a car model. (See Stevenson, at page 29, third column, and page 30, first column)

While the image simulation/rendering systems of Stevenson may be used in various applications, including the optical performance of a car model, Stevenson does not disclose, teach or suggest an "off-line programming system for a machine vision system...operable to...", as set forth in the preamble and body of independent claims 45 and 55, nor does Stevenson disclose an "off-line machine vision inspection simulation system for a machine vision inspection system...operable to ...", as set forth in independent claims 57, 65 and 69.

Further, Stevenson fails to teach or suggest the feature "a control instruction generating portion" (set forth in claims 45 and 55) which is used to generate at least one control instruction usable in an inspection program for the at least one object inspectable by the machine vision inspection system. The Office Action, at page 3, item 12, asserts that

Stevenson explicitly discloses 'fine-tuned or even construct' actual physical optical systems, and thus implicitly discloses generating control instructions to implement said fine tuning."

(emphasis added)

Under the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element "is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Cont'l Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749(Fed. Cir. 1991). "Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present.

in the prior art." *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599 (Fed. Cir. 2002) (quoting *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

As discussed above, contrary to the Office Action's interpretation, Stevenson, in the above passage at page 29, only describes a common goal of available optical vision systems. (See Stevenson, at page 29, first column) The Office Action impermissibly infers or assumes that Stevenson discloses certain features of independent claims when, in fact Stevenson does not disclose these features.

Second, for Stevenson to "decide" the "proper" parameters is not at all to control them with instructions in a machine vision system. In Stevenson, the parameters and instructions are for controlling Stevenson's image simulation engine, not for controlling a specific machine vision inspection system.

Moreover, Stevenson makes no disclosure of how to link his image simulation/image rendering engine to control a programming system for an actual machine vision system and does not even contemplate such a use. In contrast to the claimed invention, Stevenson only indicates that his system is a physically-realistic system suitable for supporting design decisions by designers of vision systems, not for providing programming instructions for a specific machine vision system.

The Office Action, at page 3, item 13, asserts that Stevenson, at pages 29, 30 and 32, discloses how to link image simulation/image rendering engine to control a programming system for an actual machine vision system. However, contrary to the Office Action's interpretation, as discussed above, page 29, column 1, of Stevenson's disclosure refers to a common goal of available optical vision systems (See Stevenson, at page 29, first column). In Stevenson, as disclosed at least at page 32, the parameters and instructions, such as light source intensity and position, are for controlling Stevenson's image simulation/image

rendering engine used in evaluating the optical performance of a car model, not for controlling a specific machine vision inspection system.

Furthermore, Stevenson does not teach or suggest "user-alterable control elements", as set forth in claims 45, 55, 57, 65 and 69, specific to the corresponding specific machine vision system. Such elements are not contemplated in Stevenson.

The Office Action, at page 3, item 15, asserts that Stevenson, at page 30, discloses these features. Specifically, the Office Action asserts that

Stevenson page 30 states "these features enable designers to visualize all the key elements of their system's optical performance". Said "key elements" (Stevenson's term) appears to include "user-alterable control elements" (Applicant's term) such as "depth of focus" per Stevenson page 32. Additionally, Stevenson's term "fine-tuned" at page 29 appears to imply parameters that are easily alterable by the user.

(emphasis added)

Applicant respectfully disagrees. As discussed above, contrary to the Office Action's interpretation, page 29, column 1, of Stevenson's disclosure refers to a common goal of available optical vision systems (See Stevenson, at page 29, first column). Further, in Stevenson, the parameters and instructions are for controlling Stevenson's image simulation engine, not for controlling a specific machine vision inspection system.

In addition, Stevenson does not teach or suggest "generate at least one control instruction usable in an inspection program for the at least one object inspectable by the machine vision inspection system, based at least partially on the current state of the user-alterable control elements" as set forth in claim 45, and similarly set forth in claim 65. Because Stevenson fails to teach or suggest user-alterable control elements specific to the corresponding specific machine vision system, Stevenson cannot teach operating an off-line

programming system or generating a control instruction that is specific to the corresponding specific machine vision system. As discussed above, Stevenson makes no disclosure of how to link his simulation engine to control a programming system for an actual machine vision system, nor how to link his simulation engine to control elements or to otherwise support elements of the user interface derived from an actual machine vision system.

Moreover, Stevenson fails to teach or suggest a user interface having features and functions recited in claims 45-72. As acknowledged by the Office Action's assertion at pages 4 and 5, the user interface of an existing machine vision system cannot be "simply copied" to interface to the system of Stevenson. However, the Office Action now interprets and asserts that "copying some of the user interface software modules" is disclosed in Stevenson.

Applicant respectfully disagrees with the Office Action's interpretation of Stevenson and its application to the user interface having the features and functions recited in claims 45-72.

In Stevenson, the two or three pre-existing programs that are combined require the respective individual user interfaces and "translators" disclosed and shown in the figures of Stevenson in order to manipulate those programs. The approach disclosed in Stevenson for software "system architecture" is notorious for resulting in programs that are "buggy", unreliable, and difficult to maintain.

In contrast to the software interface of Stevenson, the user interface set forth in claims 45-72 integrates the image rendering engine with a hardware component simulation system and a vision inspection control system derived from an actual machine vision system. This user interface overcomes the problems and limitations of Stevenson, and provides a reliable and easily maintained system that is well suited for off-line programming of specific machine vision systems by the typical users of such systems.

Additionally, contrary to the Office Action's assertion, nothing in Stevenson indicates that the image rendering engine (image simulator) disclosed in Stevenson is useful for vision inspection system training functions set forth in at least in claims 47, 51, 53, 54, 57, 62, 64, 65 and 69.

The Office Action, at pages 5-6, item 25, asserts that "Stevenson, at page 20 [sic], discloses a very detailed model for Virtual simulation of optical vision systems" which combines several commercial software packages: ASAP and Rhinoceros. The Office Action further asserts that Thomas discloses flight simulation systems which emphasize "realistic" simulation. Thus, the Office Action asserts that one of ordinary skill in the art would be motivated to combine Stevenson and Thomas to "train users for the optical vision systems. Moreover, the Office Action asserts

it would be relatively easy to permanently fix (or temporarily freeze) any parameters in Stevenson that would not be user alterable (such as input lens parameters), and thus would not be applicable for training.

Applicant respectfully disagrees with the Office Action's interpretation of Stevenson and Thomas and their application to claims 47, 51, 53, 54, 57, 62, 64, 65 and 69. Further, Applicants respectfully submit that there is no motivation to combine Stevenson, which is directed to evaluating optical performance of design modeling systems, with Thomas, which discloses the physical recreation of a cockpit of a plane and the displays associated with flying a plane.

A showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential evidentiary component of an obviousness holding." *C.R. Bard, Inc. v. M3 Sys. Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232(Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple

references, standing alone, are not “evidence.” See *In re Dembiczak*, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617.

It is impermissible for an Examiner to engage in hindsight reconstruction of the claimed invention using appellant's structure as a template and selecting elements from references to fill the page. The references themselves must provide some teaching whereby the appellant's combination would have been obvious. *In re Gorman*, 911 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir, 1991). That is, something in the prior art as a whole must suggest the desirability, and thus obviousness, of making the combination. See, *In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984).

The Office Action impermissibly engages in hindsight reconstruction of the claimed invention using Applicant's structure as a template and selecting elements from references to fill the page.

In the sense of a general training of an operator of a specific machine vision system, such an operator would not be qualified to input lens parameters and the like, as disclosed in Stevenson. Rather this requires a system designer, as disclosed in Stevenson. The Office Action, in making its assertion above, improperly uses Applicant's disclosure to read in Stevenson the rejected claim features. Stevenson never discloses using his image rendering engine (image simulator) for training purposes, nor does Stevenson disclose modifying any parameters (such as those asserted by the Office Action above) for vision inspection system training functions set forth in at least in claims 47, 51, 53, 54, 57, 62, 64, 65 and 69.

Furthermore, such training would necessarily require user-alterable control elements specific to the corresponding specific machine vision system. As discussed above, such user-alterable control elements are not contemplated in Stevenson.

Thomas provides no motivation to one skilled in the art to modify Stevenson.

Thomas, at Abstract, col. 1, lines 13-16, col. 2, lines 45-58, col. 3 lines 24-26, col. 4, line 47 to col. 6, line 49, and in Figs. 1-6, discloses the physical recreation of a cockpit of a plane and the displays associated with flying a plane. In Thomas, video images previously recorded are projected by projectors onto several screens around the pilot(s) so as to display out-the-window views that the pilot(s) would observe from the cockpit of the plane. The pilot in Thomas is fitted with a helmet having a magnetic tracker or position indicator that allows the flight simulation system to switch the various video images displayed to the pilot according to where the pilot's head and eyes are pointing at a particular moment.

For at least the reasons discussed above, Applicant submits that claims 45-72 distinguish over the applied art. Withdrawal of the rejections of claims 45, 46, 48-50, 52, 53, 55 and 56 under 35 U.S.C. §102(a) and of claims 47, 51, 52, 54 and 57-72 under 35 U.S.C. §103(a) is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 45-72 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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